PUBLIC SAFETY GIS

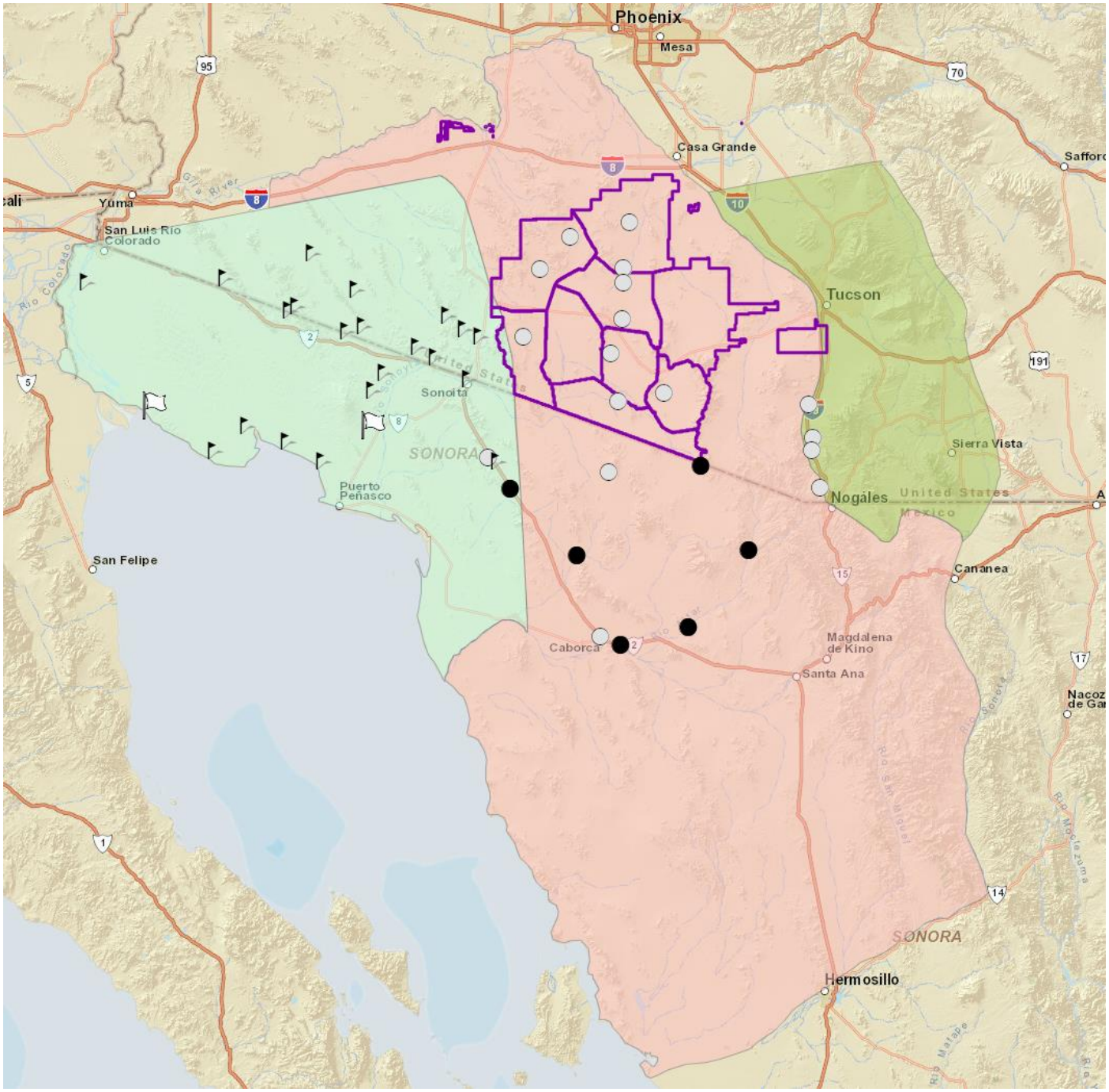
Tohono O'odham Nation

BRIEF CULTURAL HISTORY

- The O'odham, now split in to four recognized groups (the Tohono O'odham Nation, the Gila River Indian Community, the Ak-Chin Indian Community and the Salt River Indian Community), have a history as a migratory culture
- Rather than settling and farming throughout the year, they moved to where the resources were depending on the season
- With the nature of the desert, depended much on wild foods
- What farming they did took place during the brief monsoon
- A rich history of spirituality, connection to their lands
- A rich history of language, spoken by all O'odham groups, that goes back to the Uto-Aztecan language group, though each has its own dialect
- Lands and culture impacted by both peaceful and confrontational interaction with the Apaches

HISTORY OF THE NATION'S LANDS

- Have been living in the Southwest for thousands of years
- Once occupied an enormous section of the Southwest desert lands, where they lead a migratory life with minimal farming
- From the early 1700's to today, the O'odham lands have been occupied by foreign governments
- Most notably, the O'odham fell under Mexican rule after the Republic of Mexico became independent; their lands were then split almost in half when the Gadsden Purchase was completed
- Today, the O'odham live on both sides of the US/Mexico border and are forced to deal with increasing border security and equally increasing danger to continue to pursue their traditional migratory heritage



TOHONO O'ODHAM

Traditional Lands

Historic Water Sources

Historic Camps

Historic Villages

- Defense
- Major

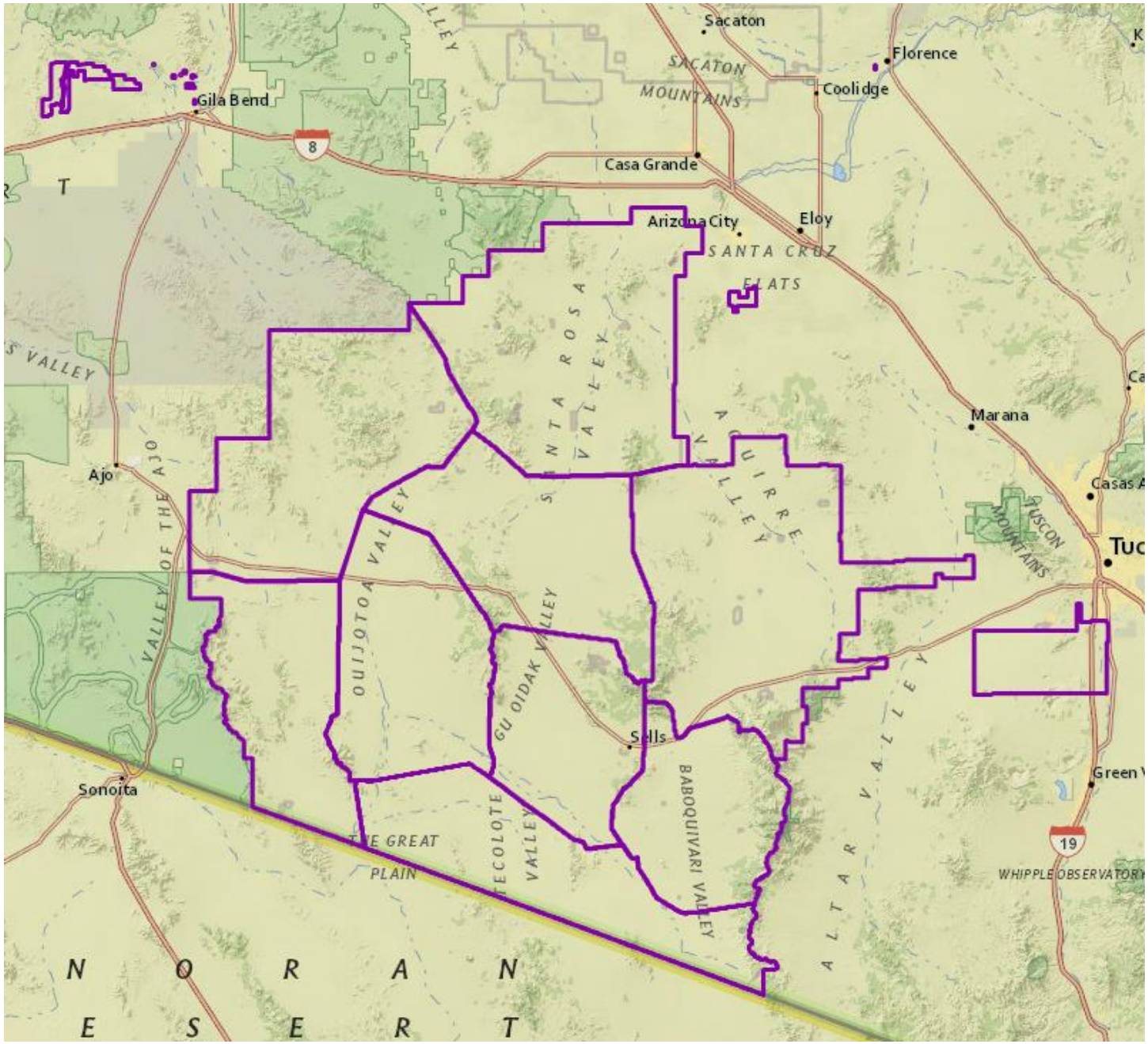
Current District Boundaries

Historic O'odham Lands

- Ak-Chin or Desert O'odham
- Arenos or Sand O'odham
- Sobaipuri

CURRENT NATION GEOGRAPHY

- The second largest reservation in Arizona in both population and geographical size, third in the United States, with a land base of 2.8 millions acres (4,460sq miles). This is approximately the same size as the State of Connecticut
- Has four non-contiguous segments; the “main” reservation, which is 2.7 million acres; San Xavier; San Lucy; and Florence Village
- Very widely dispersed communities seperated by wide desert valleys and plains, which are marked by mountains that rise abruptly to nearly 8,000 ft
- Crosses three counties (Pima, Pinal and Maricopa) and the State of Sonora in Mexico.



TOHONO O'ODHAM

Current Lands

CHALLENGES FOR PUBLIC SAFETY

- Wide spread lands make it difficult to provide services
- Especially for Police and Fire, response times are affected by many things including drive time and difficultly locating communities and homes in those communities
- No street names
- No addresses
- The population they serve faces challenges of their own
  - 40+% unemployment
  - High poverty

EXAMPLES OF GIS GOALS

- With the assistance of the Planning Department, create a house numbering and street naming process
- Link GIS to CAD to improve dispatching and response times
- Create systems to improve Police Department programs, such as deceased UDA database
- Create systems to improve Fire Department programs, such as structure information database
- Create systems to improve Emergency Management programs, such as damage assessment and hazard mitigation databases
- Find ways for field workers to work disconnected
- Implement GIS web services for desktop and mobile

WILDLAND FIRE GIS

A Day in the Life of a GIS Specialist

WILDLAND FIRE 101

- Describes any large fire that begins in rural areas
  - Differs from urban brush fires and structure fires
  - In Arizona, usually start on Public Lands
- Have many causes, but usually are categorized as human or natural
- As has been seen in the last few years, have the potential to be very destructive and deadly
- Very complex incidents that require management to protect life and property

WILDLAND FIRE CHARACTERISTICS

- Acts differently in various fuel types (forest vs. scrub vs. grass etc.)
- Can smolder or run – can be as fast as 14mph in grass
- Tend to burn “up” – uphill, up a tree, upstairs
- Can be affected by weather (Red Flag days) and can also create weather
- Burn at varied temperatures; the average is 800°C (1,472°F) but can exceed 1200°C (2,192°F)

WILDLAND FIRE WEATHER

A Pyrocumulus Cloud being fed by the Station Fire, with the City of Los Angeles in the foreground.

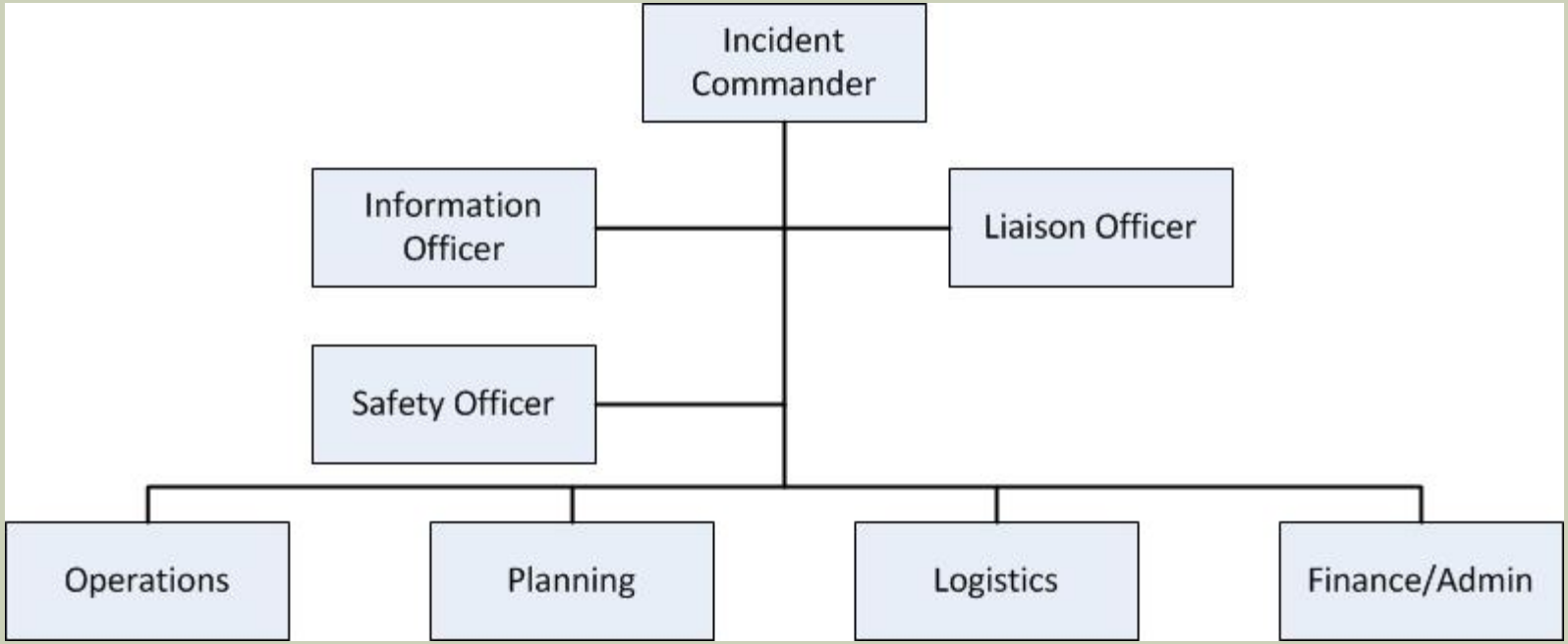
Shares characteristics with the “mushroom cloud” after a nuclear weapon is detonated

WILDLAND FIRE MANAGEMENT

- Due to the danger, complexity, and risk to both the public and firefighters all fires are managed
- There is a national structure for this management
- At the heart of this is the Incident Management Team, which has five distinct levels:
  - Type 5 – local fire officers
  - Type 4 – City/County/District fire, EMS, and law enforcement
  - Type 3 – State level standing team of trained personnel from different departments, agencies and jurisdictions
  - Type 2 – National and State level interagency team
  - Type 1 – National and State level interagency team trained to operate on the largest incidents

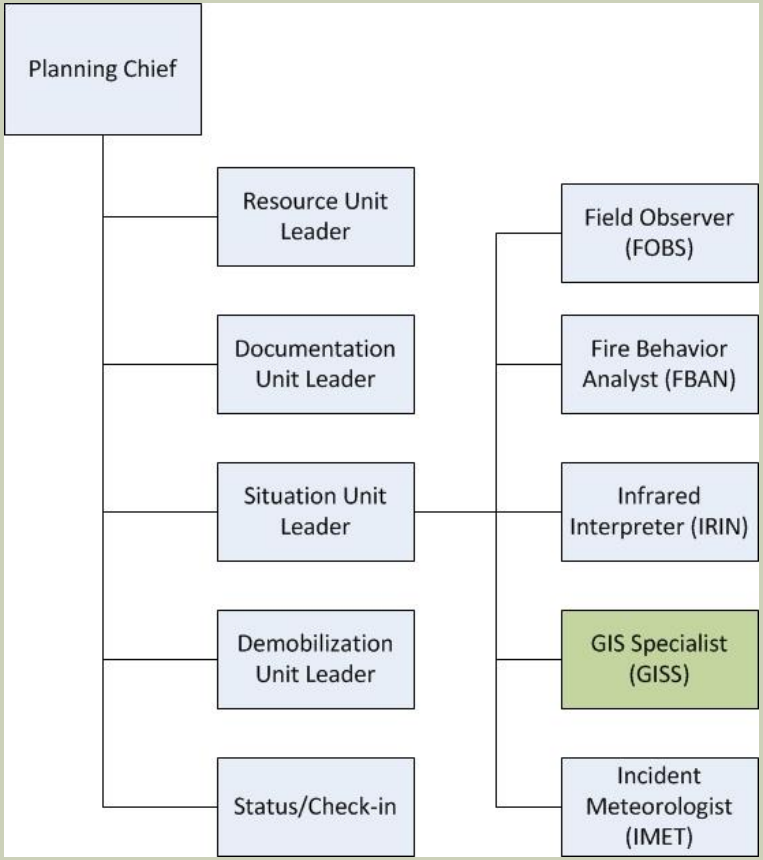
WILDLAND FIRE INCIDENT COMMAND

Part of the National Incident Management system, the Incident Command System is used in all fire incidents to provide structure to management



WHERE GOES GIS FIT?

In the planning section, under the Situation Unit Leader



GISS RESPONSIBILITIES

- Gather and process data from incident staff
- Create initial maps for use by Operations staff
- Revise and produce digital maps as needed
- Conduct GIS analysis as needed
- Print and collate maps for Incident Action Plan and other purposes
- Perform documentation of maps created, including maintenance of a standardized directory structure

A GISS NEEDS BASIC KNOWLEDGE OF:

- The Basic Incident Command System structure and procedures that are part of the National Incident Management System
  - Whom to go to for issues or support
  - Understanding of expectations of supervisor
- Work and rest standards
- Firefighter and public safety

A GISS MUST BE ABLE TO:

- Use off the shelf GIS software
- Work with a variety of data types and file types
- Understand GPS operation and data collection
- Be proficient in various projections and datum's
- Answer questions such as acreage burned
- Troubleshoot hardware and software problems sufficiently to keep the GISS operational
- Perform all of the above in “Incident Conditions”

INCIDENT CONDITIONS INCLUDE:

- Long hours (12 or 16 hours, day or night)
- Close quarters shared with various other personnel
- Stressful conditions
- Traveling for 14 days or longer
- Primitive fire camp conditions (sleeping on the ground, dust, smoke, port-a-johns, limited food choices)
- Working with fire camp personnel that could include agency, contract, military and prison crews

WHEN THE PHONE RINGS…

- Receive call from Dispatch Center
- Gather your mobilization kit, you have 2 hours to get out the door. Print basic maps, if you can
- Travel to base camp/incident command post
- Check-in
- Set up your equipment in a suitable location
- Begin making notes about what you'll need
- Establish your base data, initial map project files
- Begin making your first fire maps using intelligence from various sources, such as the Situation Unit Leader

MOBILIZATION KIT DETAILS

- Laptop with ArcGIS 10, FIMT, DNRGPS
- External hard drive, USB thumb drive, CD's, DVD's
- Router and network cables
- Power strips, extension cords, and a UPS
- USB cables for GPS
- Ample office supplies
- Basic tool kit
- Lots of tape
- Cell phone and air card, if possible
- Data
- Personal hygiene items
- Tent, sleeping bag, cot
- Layers of clothes

A DAY IN THE LIFE OF A GISS

- Work within your chain of command
- Collect, process, and disseminate spatial data
- Maintain your filing structure
- Create new data as needed, incorporating data from GPS units, digitized data, described information, etc
- Provide maps as requested by the SITL
- Document maps and archive work
- Transfer products and data to other incident personnel or to the hosting unit
- Transfer data to and from various locations, which may include FTP site or websites

FIRE CAMP

Dusty, loud, windy, bone dry, too hot, too cold, and home for up to 14 days…


HUERTA

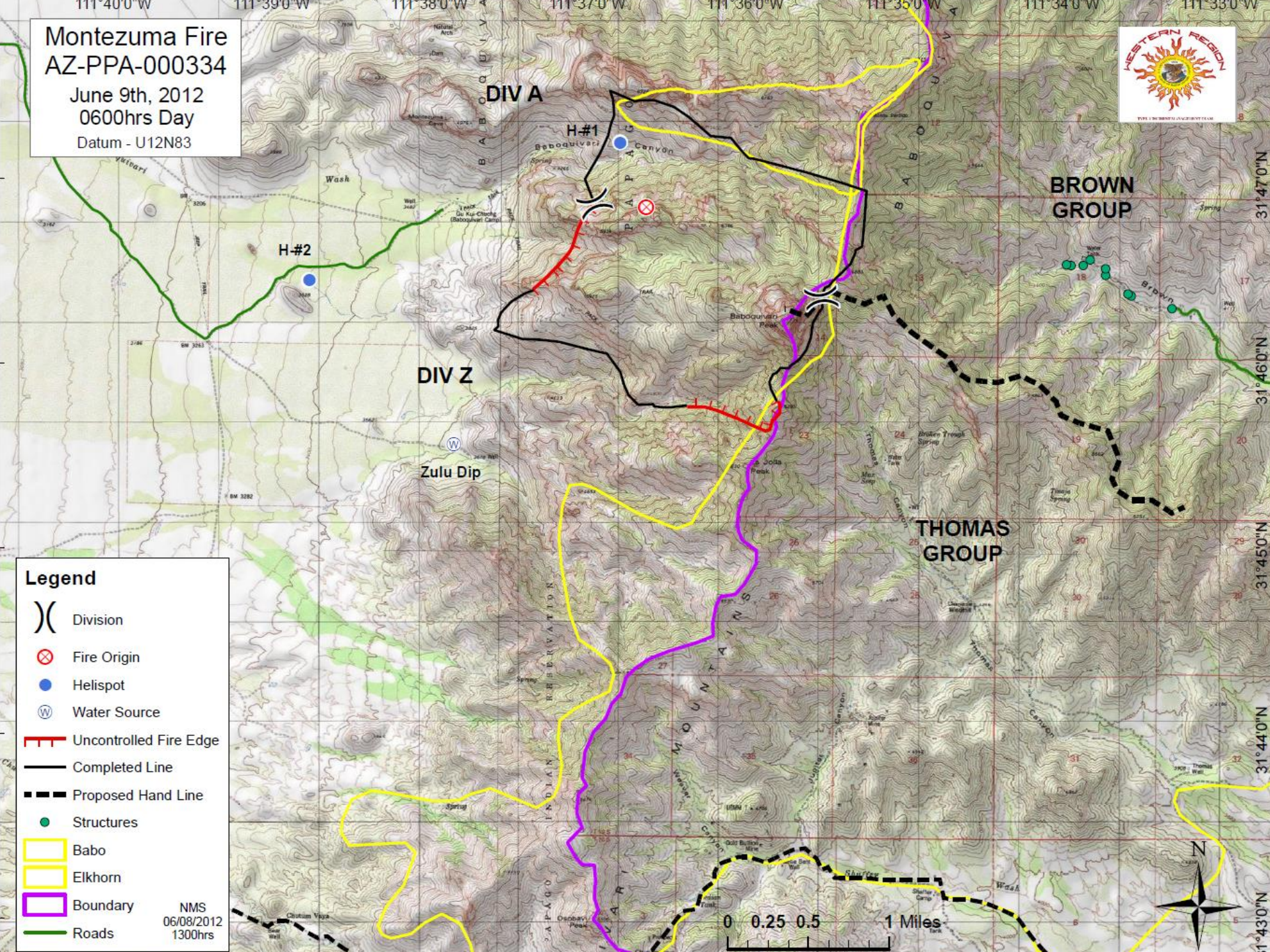

MORMON LAKE


NORTHWEST
FIRE
DISTRICT


JAY FLIGHT
ICP NORTHWEST

THE MAPS

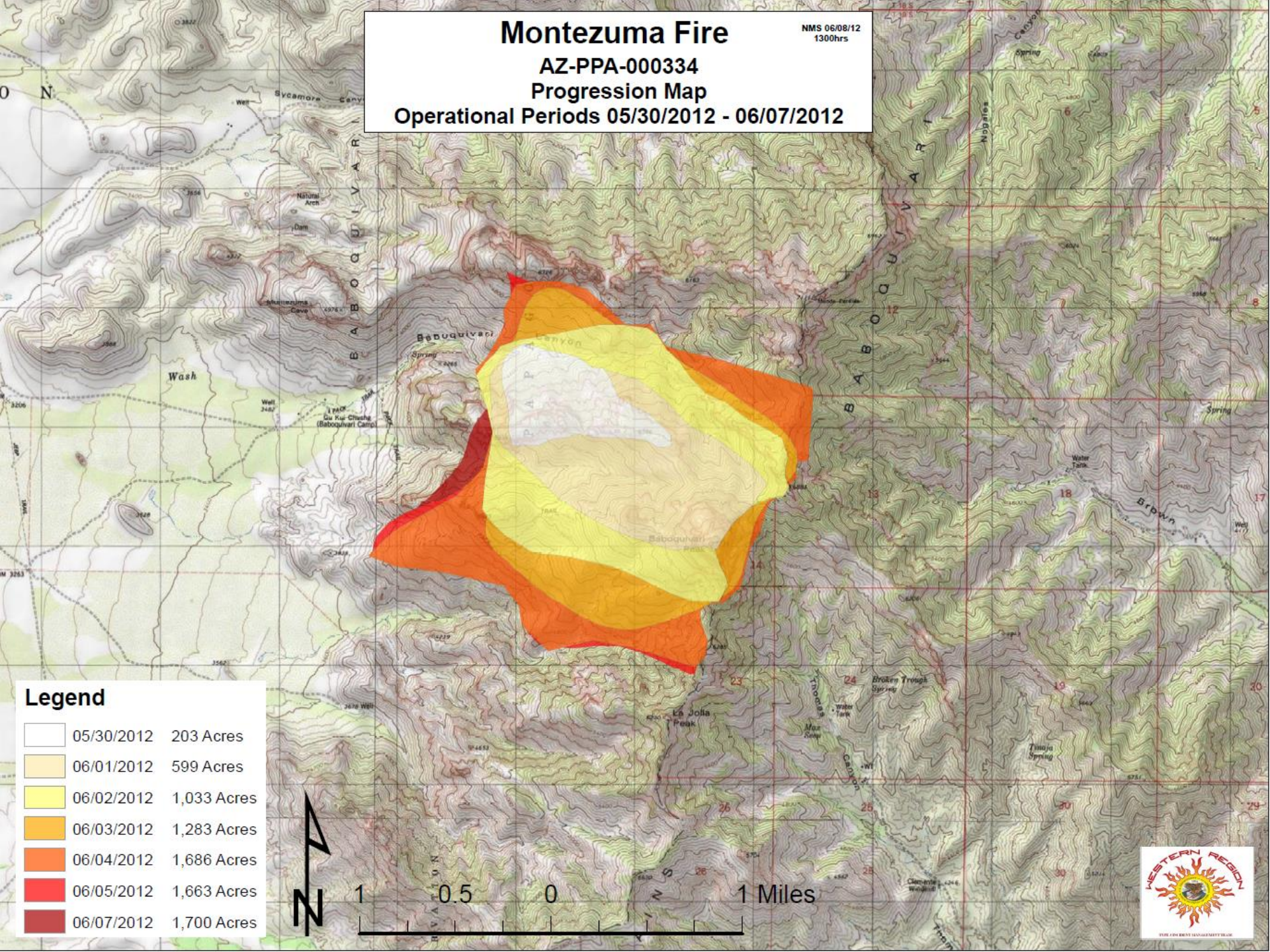
Or what keeps you up at night…

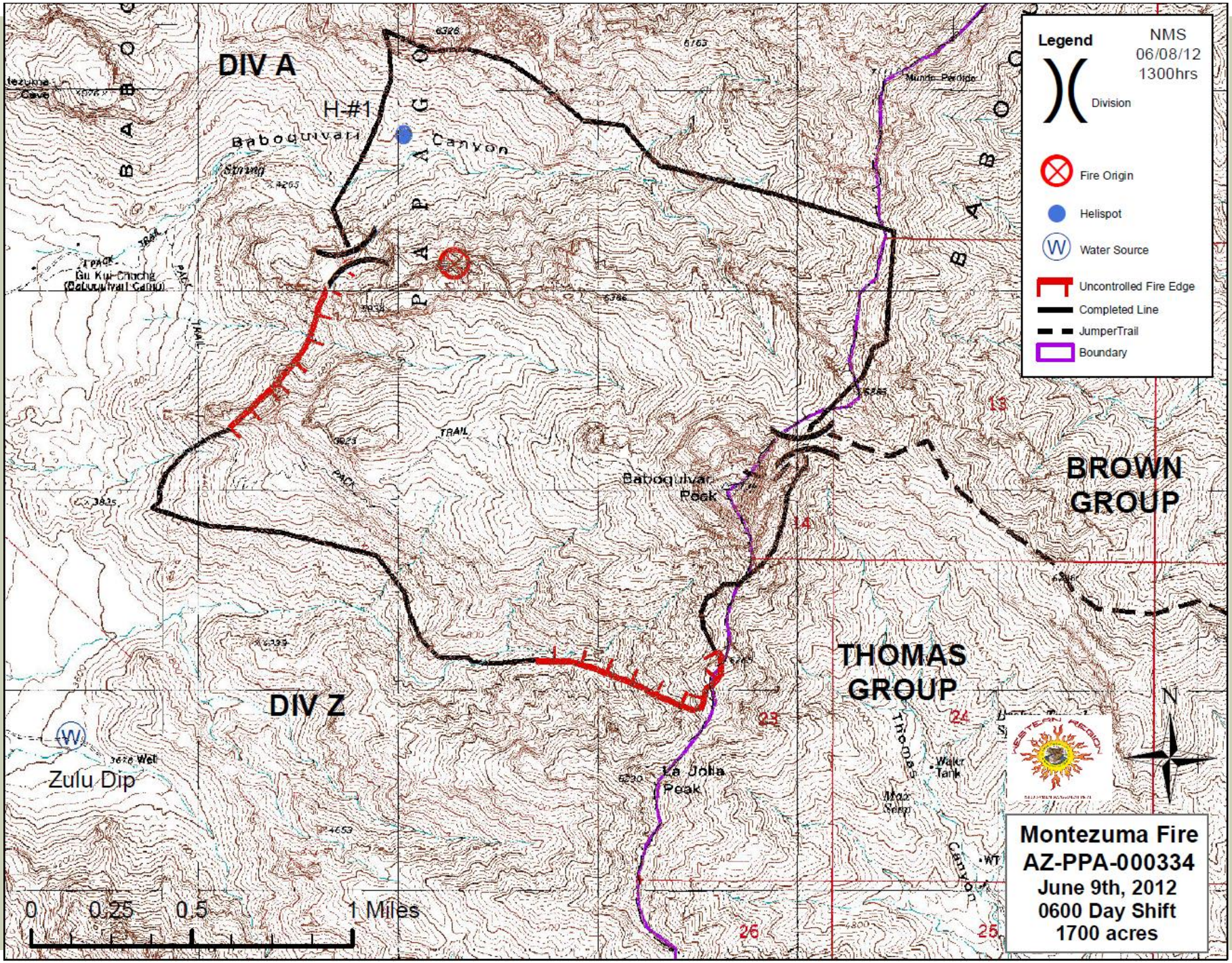

Montezuma Fire
AZ-PPA-000334
June 9th, 2012
0600hrs Day
Datum - U12N83
DIV A
H-#1
H-#2
DIV Z
Zulu Dip
BROWN GROUP
THOMAS GROUP
Legend
Division
Fire Origin
Helispot
Water Source
Uncontrolled Fire Edge
Completed Line
Proposed Hand Line
Structures
Babo
Elkhorn
Boundary
Roads
NMS
06/08/2012
1300hrs
0 0.25 0.5 1 Miles
N

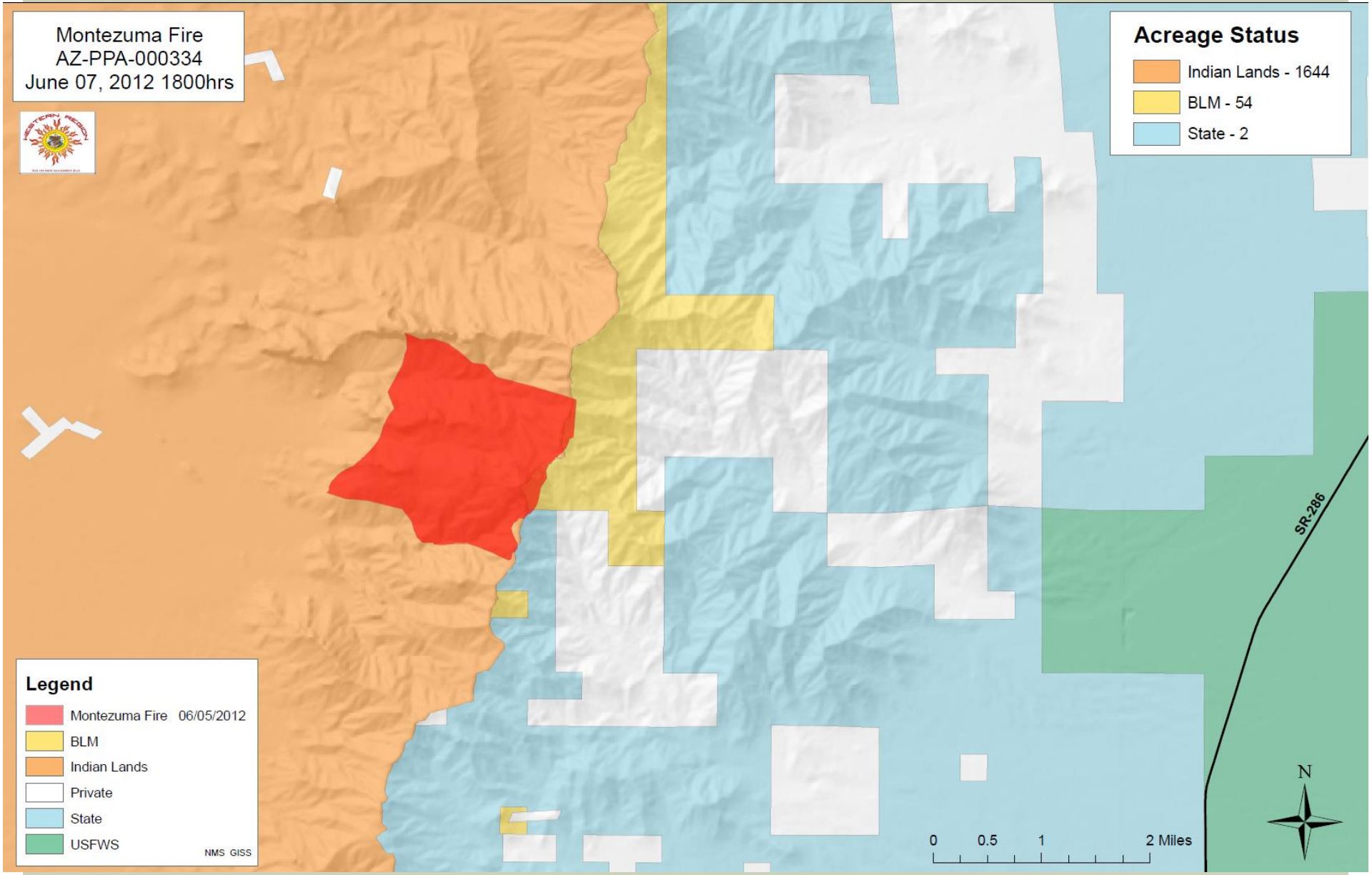
Montezuma Fire

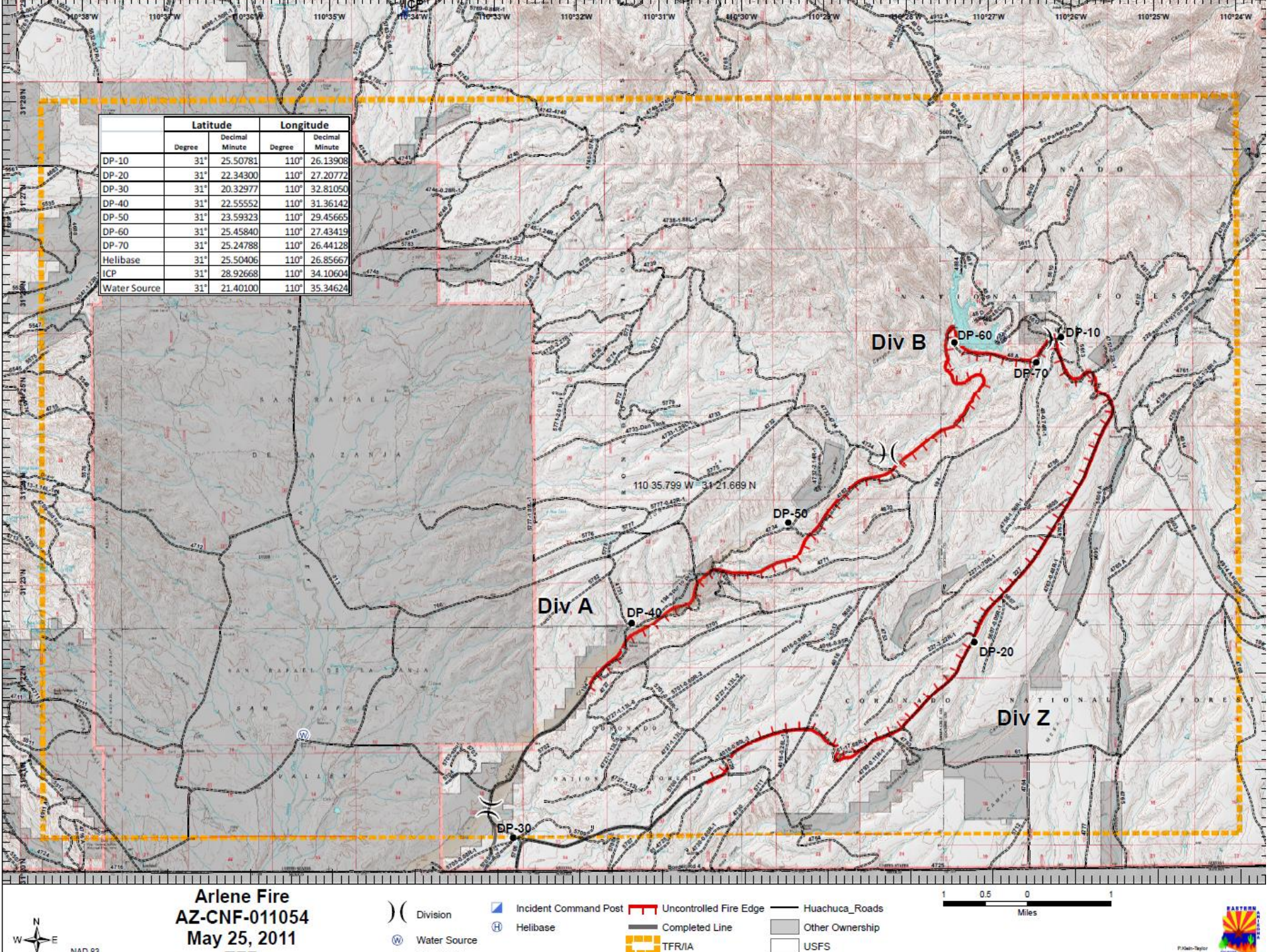
NMS 06/08/12
1300hrs

AZ-PPA-000334
Progression Map
Operational Periods 05/30/2012 - 06/07/2012

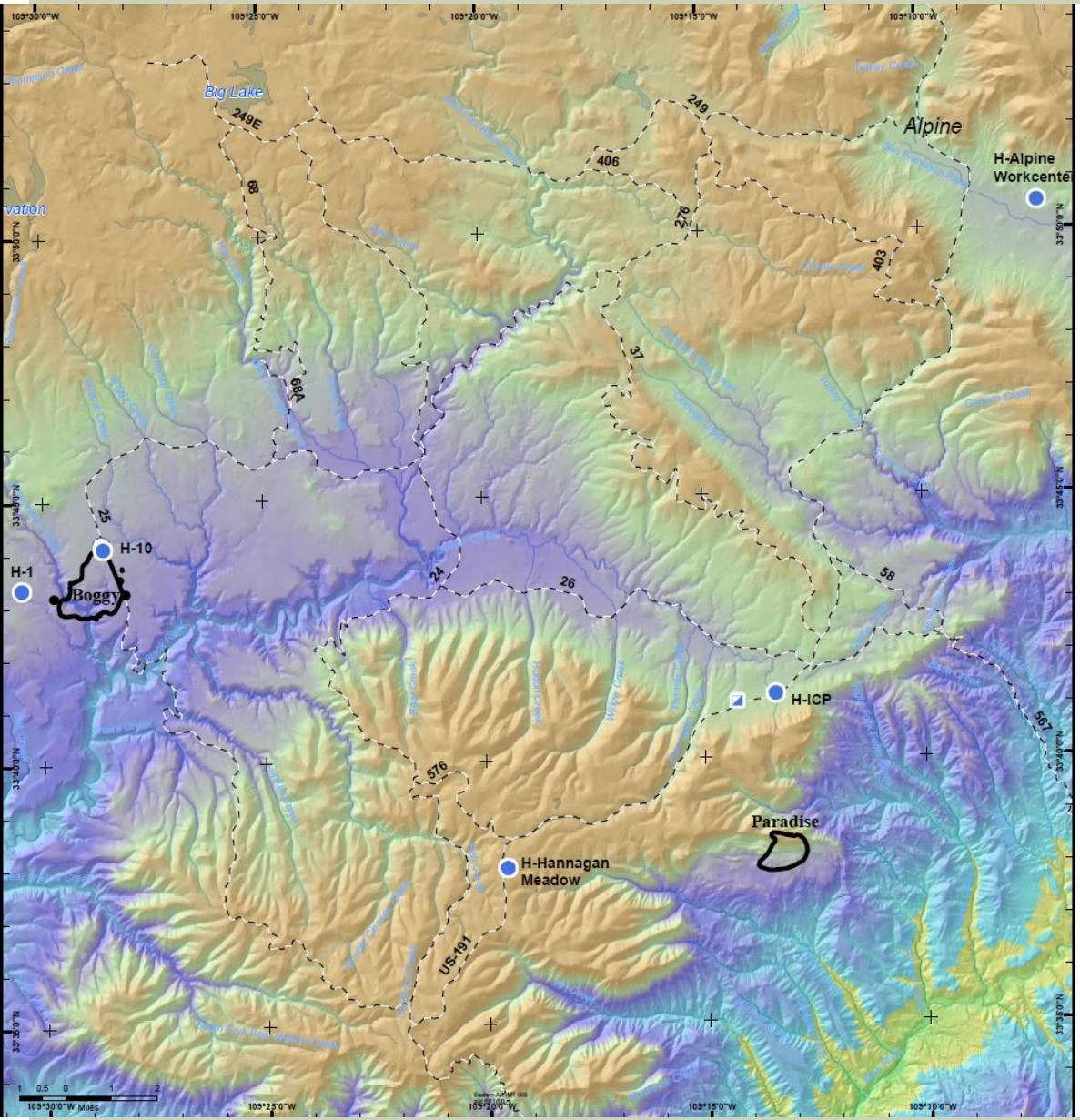



DIV A
H-#1
Babaquivari Canyon
DIV Z
Zulu Dip
Babaquivari Peak
La Jolla Peak
BROWN GROUP
THOMAS GROUP
Legend
NMS
06/08/12
1300hrs
Division
Fire Origin
Helispot
Water Source
Uncontrolled Fire Edge
Completed Line
JumperTrail
Boundary
0 0.25 0.5 1 Miles
Montezuma Fire
AZ-PPA-000334
June 9th, 2012
0600 Day Shift
1700 acres


Montezuma Fire
AZ-PPA-000334
June 07, 2012 1800hrs
Acreage Status
Indian Lands - 1644
BLM - 54
State - 2
SR-286
Legend
Montezuma Fire 06/05/2012
BLM
Indian Lands
Private
State
USFWS
NMS GISS
0 0.5 1 2 Miles
N


Latitude
Longitude
Degree
Decimal Minute
Degree
Decimal Minute
DP-10 31° 25.50781 110° 26.13908
DP-20 31° 22.34300 110° 27.20772
DP-30 31° 20.32977 110° 32.81050
DP-40 31° 22.55552 110° 31.36142
DP-50 31° 23.59323 110° 29.45665
DP-60 31° 25.45840 110° 27.43419
DP-70 31° 25.24788 110° 26.44128
Helibase 31° 25.50406 110° 26.85667
ICP 31° 28.92668 110° 34.10604
Water Source 31° 21.40100 110° 35.34624
Div B
Div A
Div Z
DP-10
DP-20
DP-30
DP-40
DP-50
DP-60
DP-70
110 35.799 W 31 21.669 N
Arlene Fire
AZ-CNF-011054
May 25, 2011
NAD 83
Division
Water Source
Incident Command Post
Helibase
Uncontrolled Fire Edge
Completed Line
TFR/IA
Huachuca_Roads
Other Ownership
USFS
1 0.5 0 1
Miles

Boggy & Paradise Fires
AZ-ASF-100095
Air Ops Map
June 13, 2010



Legend

- Drop Point
- Helispot
- Camp
- Incident Command Post
- Roads

Helispots	Latitude	Longitude
H-Hannagan Meadows	33° 37.963'N	109° 19.548'W
H-ICP	33° 41.212'N	109° 13.398'W
H-10	33° 44.102'N	109° 28.643'W
H-1	33° 43.338'N	109° 30.498'W
H-Alpine Workcenter	33° 50.51'N	109° 7.288'W

	Latitude	Longitude
DP-20	33° 44.191'N	109° 28.577'W
DP-30	33° 43.249'N	109° 28.141'W
DP-10	33° 43.18'N	109° 29.771'W
ICP	33° 41.079'N	109° 14.273'W
Camp	33° 44.174'N	109° 28.682'W
Luna Lake Dipsite	33° 49.727'N	109° 5.098'W